

DUAL HIGH CURRENT OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM4556A integrated circuit is a high-gain, high output current dual operational amplifier capable of driving $\pm 70\text{mA}$ into $150\ \Omega$ loads ($\pm 10.5\text{V}$ output voltage), and operating low supply voltage ($V^+/V^- = 2\text{V} \sim$).

The NJM4556A combines many of the features of the popular NJM4558 as well as having the capability of driving $150\ \Omega$ loads. In addition, the wide band-width, low noise, high slew rate and low distortion of the NJM4556A make it ideal for many audio, telecommunications and instrumentation applications.

■ FEATURES

- Operating Voltage $(+2\text{V} \sim +18\text{V})$
- High Output Current $(10 \sim 70\text{mA})$
- Slew Rate $(3\text{V}/\mu\text{s typ.})$
- Gain Band Width Product (8MHz typ.)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

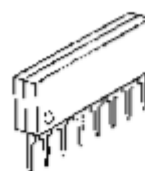
■ PACKAGE OUTLINE



NJM4556AD



NJM4556AM

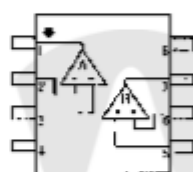


NJM4556AL



NJM4556AV

■ PIN CONFIGURATION



NJM4556AD
NJM4556AM
NJM4556AV

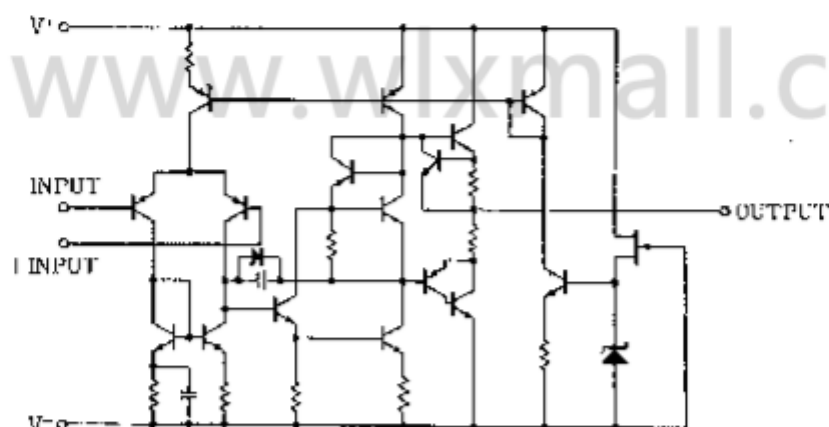


NJM4556AL

PIN FUNCTION

1. A OUTPUT
2. A- INPUT
3. A+ INPUT
4. V^-
5. B+ INPUT
6. B- INPUT
7. B OUTPUT
8. V^+

■ EQUIVALENT CIRCUIT (1/2 Shows)



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{VV}	±18	V
Differential Input Voltage	V _{in}	±30	V
Input Voltage	V _{ic}	±15 (note)	V
Power Dissipation	P _D	(DIP8) 700	mW
		(DMPS) 300	mW
		(SSOPR) 250	mW
		(SIP8) 800	mW
Operating Temperature Range	T _{op}	-20 ~ +75	°C
Storage Temperature Range	T _{stg}	-40 ~ +125	°C

(note) For supply voltage less than +15V, the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS (NJM4556AD/NJM4556AS)

(V_V/V₋ = -15V, T_a = 25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{io}	R _S ≤ 10kΩ	—	0.5	6.0	mV
Input Offset Current	I _{io}		—	5	60	nA
Input Bias Current	I _b		—	50	500	nA
Input Resistance	R _{in}		0.3	5	—	MΩ
Large Signal Voltage Gain	A _v	R _L ≥ 2kΩ, V _O = ±10V	86	100	—	dB
Maximum Output Voltage Swing 1	V _{OM1}	R _L ≥ 2kΩ	±12	±13.5	—	V
Maximum Output Voltage Swing 2	V _{OM2}	R _L ≥ 150Ω	±10.5	±11	—	V
Input Common Mode Voltage Range	V _{icM}		-13.5	+14	—	V
Common Mode Rejection Ratio	CMR	R _S ≤ 10kΩ	70	90	—	dB
Supply Voltage Rejection Ratio	SVR	R _S ≤ 10kΩ	76.5	90	—	dB
Operating Current	I _{cc}		—	9	12	mA
Slew Rate	SR		—	3	—	V/μs
Gain Bandwidth Product	GB		—	8	—	MHz

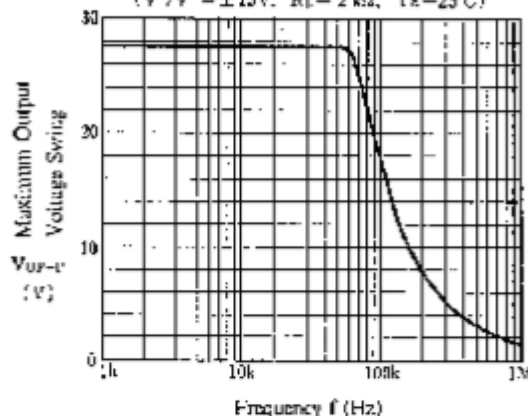
■ ELECTRICAL CHARACTERISTICS (NJM4556AM/NJM4556AV)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{io}	R _S ≤ 10kΩ	—	0.5	6.0	mV
Input Offset Current	I _{io}		—	5	60	nA
Input Bias Current	I _b		—	50	500	nA
Large Signal Voltage Gain	A _v	R _L ≥ 2kΩ, V _O = ±10V	86	100	—	dB
Maximum Output Voltage Swing 1	V _{OM1}	V _{DS} = -4V, V _{BS} = -3V, V ₊ = 9V I _{source} = 40mA	7.5	—	—	V
Maximum Output Voltage Swing 2	V _{OM2}	V _{DS} = -3V, V _{BS} = -2V, V ₊ = 9V I _{sink} = 40mA	—	—	2.1	V
Input Common Mode Voltage Range 1	V _{icM1}	V ₊ = 9V, V _{in}	—	—	1.5	V
Input Common Mode Voltage Range 2	V _{icM2}	V ₊ = 9V, V _{in}	8	—	—	V
Common Mode Rejection Ratio	CMR	R _S ≤ 10kΩ	70	90	—	dB
Supply Voltage Rejection Ratio	SVR	R _S ≤ 10kΩ	76.5	90	—	dB
Supply Current	I _{cc}	V ₊ = 9V	—	8	12	mA
Slew Rate	SR		—	3	—	V/μs
Gain Bandwidth Product	GB		—	8	—	MHz

■ TYPICAL CHARACTERISTICS

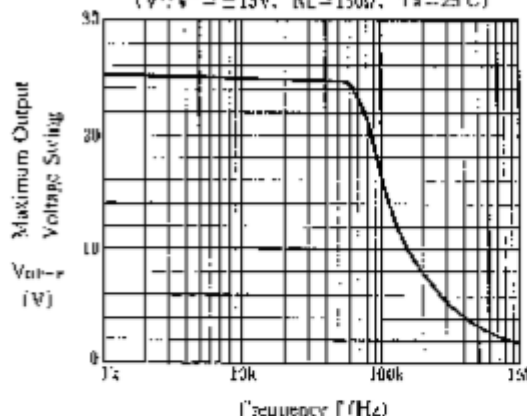
Maximum Output Voltage Swing
vs. Frequency

($V^+/V^- = \pm 15V$, $R_L = 2k\Omega$, $T_a = 25^\circ C$)



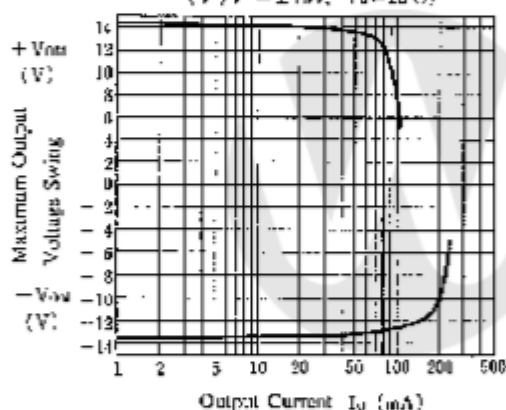
Maximum Output Voltage Swing
vs. Frequency

($V^+/V^- = \pm 15V$, $R_L = 150\Omega$, $T_a = 25^\circ C$)



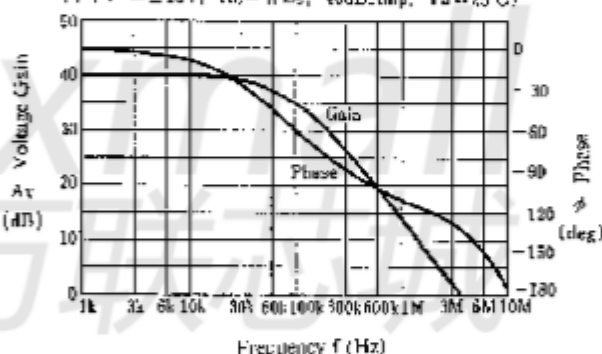
Maximum Output Voltage Swing
vs. Output Current

($V^+/V^- = \pm 15V$, $T_a = 25^\circ C$)



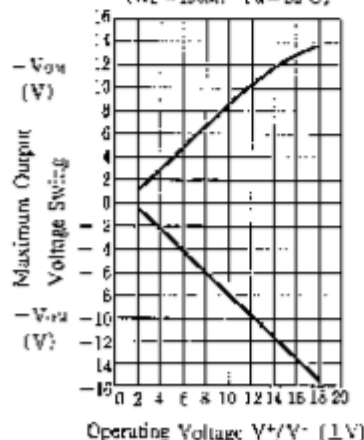
Voltage Gain, Phase Shift vs. Frequency

($V^+/V^- = \pm 15V$, $R_L = 2k\Omega$, 40dBamp, $T_a = 25^\circ C$)



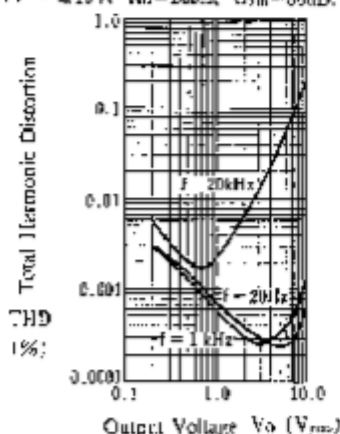
Maximum Output Voltage Swing
vs. Operating Voltage

($R_L = 150\Omega$, $T_a = 25^\circ C$)



Total Harmonic Distortion
vs. Output Voltage

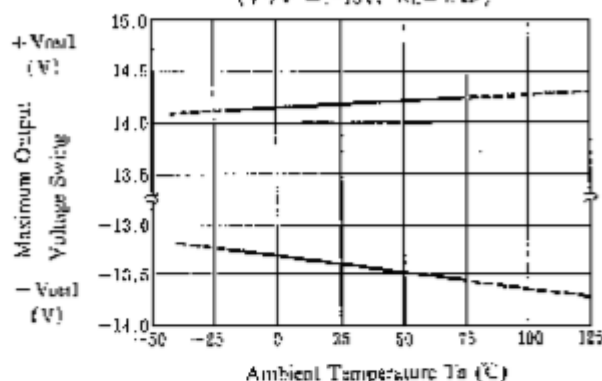
($V^+/V^- = \pm 15V$, $R_L = 200\Omega$, $G_{1in} = 30dB$, $T_a = 25^\circ C$)



TYPICAL CHARACTERISTICS

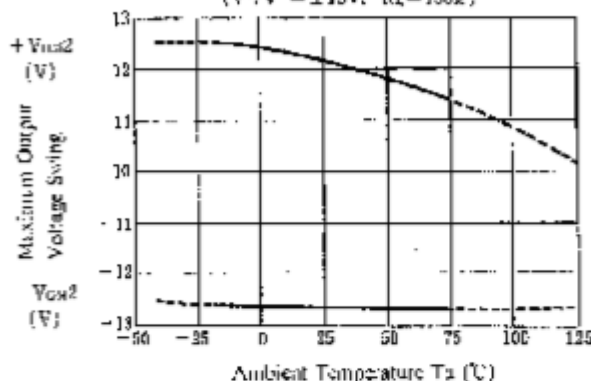
Maximum Output Voltage Swing
vs. Temperature

($V^+/V^- = \pm 15V$, $R_L = 2k\Omega$)



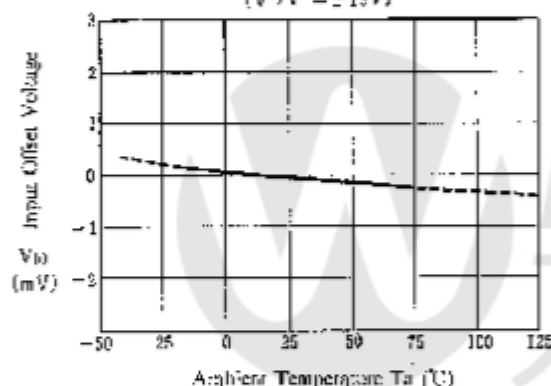
Maximum Output Voltage Swing
vs. Temperature

($V^+/V^- = \pm 15V$, $R_L = 150\Omega$)



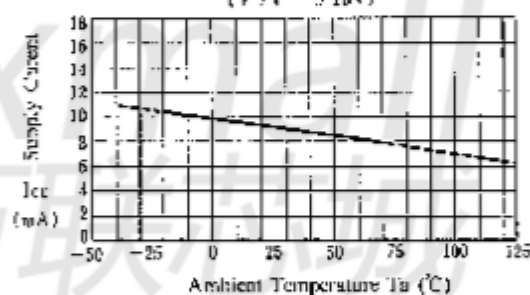
Input Offset Voltage vs. Temperature

($V^+/V^- = \pm 15V$)



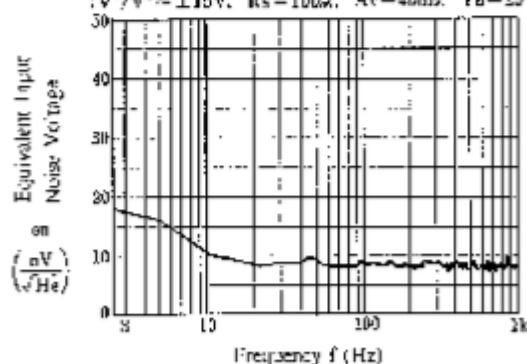
Supply Current vs. Temperature

($V^+/V^- = \pm 15V$)



Equivalent Input Noise Voltage
vs. Frequency

($V^+/V^- = \pm 15V$, $R_s = 100\Omega$, $A_v = 40dB$, $T_a = 25^\circ C$)



Operating Current vs. Operating Voltage

($T_a = 25^\circ C$)

